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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,559

03/21/2005

Mineki Okamoto

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02/09/2006

SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER

HORN, ROBERT WAYNE

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/528,559	<b>Applicant(s)</b> OKAMOTO ET AL.	
	<b>Examiner</b> Robert W. Horn	<b>Art Unit</b> 2837	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ s/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/21/2005</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Drawings***

Figures 1, 3, 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. As designated in patent 6,751,538, the applicant's figure 1 is figure 30 (prior art); the applicant's figure 8 is figure 29 (prior art); the applicant's figure 3 is figure 2 (prior art); the applicant's figure 7 and 8 are described as prior art in the applicant's specification. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The power steering apparatus is already associated with an automobile; therefore the limitation of automobile equipped with power steering apparatus of the preceding does not add anything new.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as based on indefinite claim language. The fourth limitation in claim 1 states that the “control system... is capable of independently designing...” The Mirriam-Williams Dictionary defines *design*: “to conceive and carry out in the mind.” On the one hand, the meaning of being capable of doing is vague. On the other hand the terms design provides only a vague suggestion as to what the applicant regards as his invention, since it is not clear and definite what it would mean for a control system “to conceive and carry out in the mine.”

Claim 1 is further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, because claims 1 in elements 2 and 3 make reference to the acronym SAT. The meaning of the acronym must be specified in the claim.

The examiner acknowledges that the acronym is shown in the specification as the *self-aligning torque*. The term “SAT” amended as –SAT (self-aligning torque--) may still be ambiguous and therefore indefinite. SAT is also referred to in the prior art as the road surface reaction force torque (Fujioka, et al. U.S. Patent 6,938,725, column 4, lines 41-42). The reference to SAT as self-aligning torque, does not describe what makes the torque self-aligning or to what it is self-aligning. It could reasonably refer to several

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things, including the small torque normally exerted by a steering system to move the steering to straight driving, or it could be a characteristic of the road surface reaction to the steering torque.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 5,473,539), and further in view of Takeuchi et al. (U.S. Patent 6,527,079).

In order to examine the claim on the merits, the examiner has established a meaning for the terms that render the claims indefinite, as follows:

*independently design* is taken to mean that the control system independently controls

SAT is assumed to mean, as described by Fujioka, et al. above, "road surface reaction torque force."

Regarding claim 1, Shimizu et al. teaches an electric power steering apparatus for controlling a motor based on a current command value calculated from a steering assist command value calculated based on a steering torque generated in a steering shaft and from a current detection value of the motor which gives a steering mechanism a steering assist force (abstract), comprising:

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a torque filter for processing a torque signal (figure 4 columns 7 and 8);

wherein:

said electric power steering apparatus also comprises a control system with two degree of freedom (figure 11, 3 degrees of freedom, figure 12, 2 degrees of freedom, column 11, lines 35-67) which is capable of independently designing frequency characteristics of steering feeling (column 1, lines 52-56) and road information sensitivity (column 6, lines 12-26).

Shimizu et al. does not explicitly teach the limitations

an SAT estimating function; and

an SAT filter for signal-processing SAT information from said SAT estimating function.

Takeuchi et al teach these limitations. Takeuchi et al. teaches the limitations of the SAT estimating function and filter in terms of the road surface estimation means (abstract) and filter (column 19, lines 57-60).

Takeuchi et al. teaches a motivation for his road surface reaction or SAT estimating function the increased safety when teach road-surface reaction force is small in case of snow or frozen crust (column 1, line 64 to column 2, line 7).

Considering the objective evidence, it would have been obvious to someone of ordinary skill in the art of motor control related to power steering feel and road responsiveness to combine the features of the torque sensors and filter, taught by Shimizu et al. and the SAT (road responsiveness evaluation) and SAT filter to create a power steering controller capable of two (or more) degrees of freedom and the

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independent control of steering feeling and road responsiveness, as taught jointly by Shimizu et al. and Takeuchi et al., motivated to make the car with the electric power steering safer.

Regarding claim 2, Shimizu et al. and Takeuchi et al. teach an electric power steering apparatus according to Claim 1, and Takeuchi et al. teaches the limitation wherein gain of said steering feeling is set such that the gain maintains at a constant value up to frequency as high as possible (figures 7-11, columns 11 and 12). The teachings of Takeuchi et al. on the optimized control of gain of steering feeling is suggested of controlling gain to as high as possible (for safety, etc.).

Regarding claim 3, Shimizu et al. and Takeuchi et al. teach an electric power steering apparatus according to Claim 1, and the combination of the teachings regarding filtering provide the limitation wherein said road information sensitivity can eliminate information in an unnecessary frequency band (filtered).

Regarding claim 4, Shimizu et al. and Takeuchi et al. teach an electric power steering apparatus according to Claim 3, but not the remaining limitation. The references teach the claimed invention except the limitation wherein said unnecessary frequency band is in a range of 10Hz to 30Hz. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the filtering range to 10 Hz to 30 Hz, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Regarding claim 5, Shimizu et al. and Takeuchi et al. teach an automobile which

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is equipped with the electric power steering apparatus according to any one of the preceding claims 1 to 4 (abstracts).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. There is a substantial record of references that read on the various claims not cited in this action, but cited on the form 892. The applicant is advised to review these additional references in preparing a response to this action, as it is proper for the examiner to cite these references in succeeding actions if the subject matter of amendments merits the inclusion.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W. Horn whose telephone number is 571-272-8591. The examiner can normally be reached on M-F.

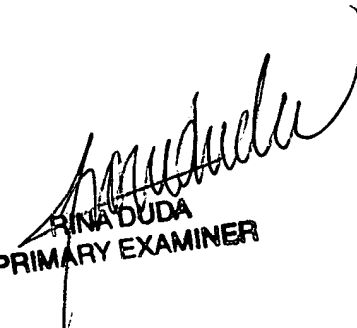
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571-272 2800, ext 33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

rwh  
January 30, 2006

  
RINA DUDA  
PRIMARY EXAMINER